

LIVERMORE LAB REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, June 10-14, 2013.

POPSCI THE FUTURE NOW GOOD NEWS FOR YOUR BRAIN



Research suggests the brain continues to make neurons into adulthood. *Image courtesy of National Institutes of Health.*

Here's food for thought: Your brain continues to make new neurons into adulthood and beyond.

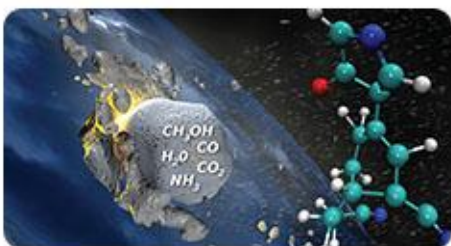
Using data derived from nuclear weapons testing of the 1950s and '60s, Lawrence Livermore scientists have found that a small portion of the human brain involved in memory makes new neurons well into adulthood.

The research may have profound impacts on human behavior and mental health. The study supports the importance of investigating the therapeutic potential of applying adult neurogenesis to the treatment of age-related cognitive disorders.

Neurogenesis is the process by which neurons are generated from neural stem and progenitor cells and, until now, were believed to be most active during pre-natal development.

LLNL's Bruce Buchholz, colleagues from the Karolinska Institute in Sweden and international collaborators found that hippocampal neurogenesis occurs at significant levels through adulthood and into old age.

To read more, go to Popsci.com



Comets may be carriers of the building blocks for life.

New research shows that life on Earth may have come from out of this world.

Lawrence Livermore scientist Nir Goldman and University of Ontario Institute of Technology colleague Isaac Tamblyn (a former LLNL postdoc) found that icy comets that crashed into Earth billions of years ago could have produced life building organic compounds, including the building blocks of proteins and nucleobases pairs of DNA and RNA.

Comets contain a variety of simple molecules, such as water, ammonia, methanol and carbon dioxide, and an impact event with a planetary surface would provide an abundant supply of energy to drive chemical reactions.

"The flux of organic matter to Earth via comets and asteroids during periods of heavy bombardment may have been as high as 10 trillion kilograms per year, delivering up to several orders of magnitude greater mass of organics than what likely pre-existed on the planet," Goldman said.

To read more, go to Yahoo.com



High performance computing (HPC) can save energy companies enormous amounts of time in the development of new products and technologies compared to the traditional methods, according to hpc4energy.org, an incubator project at the Lawrence Livermore National Laboratory.

HPC analysis is saving companies like General Electric, Robert Bosch, and the New England Independent System Operator (IS) thousands of hours by using supercomputers to develop new products and technologies.

Using a supercomputer, the GE Energy Consulting group was able to drop the time required to run an analysis from 23.5 days to 23 minutes. That's a savings of 33,817 minutes on the calculation that's used to model how large blocks of electricity can safely and securely flow across a power grid.

Lawrence Livermore and its HPC Innovation Center group started the [hpc4energy](http://hpc4energy.org) project in 2011 with the goal of pairing national labs with a select group of energy companies to demonstrate how HPC resources can help the energy companies with their technology and product development.

To read more, go to hpcwire.com



Livermore scientists have discovered a new method that may save the world's marine ecosystems by offsetting ocean acidification.

Scientists at Lawrence Livermore have developed a way to get a triple win - removing carbon from the atmosphere, reducing the acidity of the world's oceans and producing hydrogen.

"We not only found a way to remove and store carbon dioxide from the atmosphere while producing valuable H₂, we also suggest that we can help save marine ecosystems with this new technique," says Greg Rau, a visiting scientist at Lawrence Livermore and senior scientist at UC Santa Cruz.

The team found that an electrolyte solution could absorb carbon dioxide while producing hydrogen fuel and other gases.

The researchers suggest that the carbonate and bicarbonate produced in the process can be used to mitigate ongoing ocean acidification, similar to how an Alka Seltzer neutralizes excess acid in the stomach.

To read more, go to the [Sustainable Business.com](https://www.sustainablebusiness.com).

MercuryNews.com TIME IS ON HIS SIDE



From left: Steve Maguire, who won in the video category of the 2013 Flame Challenge, Alan Alda and Nick Williams, who won in the written category.

So what is time?

Give the answer some thought, and then ponder how you might explain it to a group of fifth-graders. That's the problem retired Lawrence Livermore Laboratory electronics engineer Nick Williams tackled to win the 2013 "Flame Challenge," an international kid-judged science contest sponsored by Stony Brook University on Long Island, N.Y., and actor Alan Alda.

By comparing the march of time to constant forward motion -- unstoppable and irreversible -- Williams, a presenter with Lawrence Livermore's "Fun With Science" program, bested nearly 400 scientists from all over the globe in the contest's written category. His entry was voted as the best by thousands of fifth-grade judges.

To read more, go to MercuryNews.com

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance. To send input to the *Livermore Lab Report*, send [e-mail](#).